## An Assessment of Tropical Dryland Forest Management in Africa: What Are Its Lessons?

By Gérard Madon (MARGE, France)

This presentation is based mainly on two discussion papers, both prepared for ESMAP (Energy Sector Management Assistance Program): "Sustainable Woodfuel Supplies from the Dry Tropical Woodlands" by Gerald Foley (1998), and "Dry Tropical Forest Management and Household Energy" by Michel Matly and myself (1999).

- More than 2 billion people still depend on woodfuel.
- Pressure on natural vegetation cover, especially for tropical dry-land forests (TDLF).
- Best practice now: "devolution of forest management to the local communities".
  - proven in practice
  - cost effective
  - simple & quick
  - contributes to poverty alleviation and gender equity in rural areas

## **What Are Tropical Dry-Land Forests?**

## TDLF cover about 250 million hectares:

- 64% in Africa (FAO, 1993).
- ranging from light scattered scrub to relatively dense woodland (savannah, miombo woodland).
- of the 7 categories of natural vegetation cover in sub-Saharan Africa are TDLF ('94 World Bank study, Millington and al)



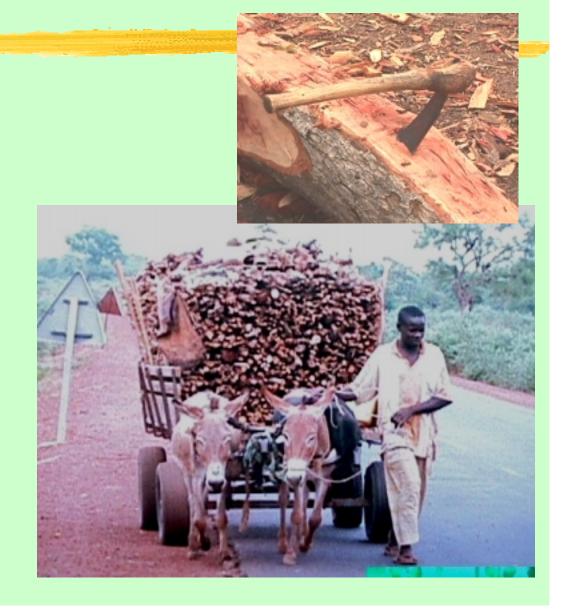
# Common characteristics

- low population density: 5-10 persons per sq km in low rainfall areas to less than 30 persons per sq km
- I permanent disequilibrium; many dead trees; recurring cycles of severe and prolonged droughts followed by periods of high rainfall.



## **Human Impacts on TDLF: Facts and Beliefs**

- TDLF areas have been altered irrevocably by human intervention,
  - does not mean productive capacity has been destroyed.
- Modern research reverses the most deeply-held beliefs:
  - I degradation can be reversed with proper intervention
  - rural population is not immature and destructive
  - the term deforestation is widely but imprecisely used



## **Major causes of deforestation?**

#### Farming

account for 90% or more of deforestation, but loss of standing stock could be surprisingly low

#### Use of fire

- used at least for 2,500 years in Africa
- in most case, fire are well controlled

#### Pastoralism

- a critically important element for the TDLF ecology
- Woodfuel gathering for rural use
  - I impact very limited on the resource
- Woodfuel harvesting for urban market supply
  - I large scale and concentrated, but do not generally destroy the regeneration capacity
  - concern less than 1 or 2% of the total wooded areas





## **Emergence of the "woodfuel crisis"**

- "Woodfuel crisis" also called the "other energy crisis" (Eckholm, 1976)
- CILSS & Club du Sahel predicted that "... in the absence of vigorous action now, much of the Sahel region will have become a desert by the year 2000."
- In 1981, FAO woodfuel map: projecting that 2.4 billion of people will face an acute woodfuel scarcity by the year 2000 (de Montalembert and Clement, 1983)
- World Bank 1984: accelerating "gap" between the supply and demand of woodfuel (Newcombe)
- Result: major donor financed activities
- but most of these activities failed

## Failures & Step-By-Step Learning

- Improved cooking stoves
- Improved charcoalmaking techniques
- Interfuel substitution
- Forestry plantations
- Farm and community forestry
- Legal and fiscal measures





## **Exaggerated Woodfuel Problem**

- The woodfuel crisis was greatly exaggerated.
- It did draw attention of Governments and donor agencies, but has largely prejudiced the interpretation of problems and the design of solutions.
- The fault lays in the weakness of the widely used "energy gap" approach (comparison of woodfuel consumption with annual biomass growth):
  - underestimate standing stocks (diameter of tree, exclude farm trees, etc.)
  - new studies indicate that yields may be considerably higher
  - I no accurate data on charcoal transition & interfuel substitution
  - "gap" model has high sensitivity.

## Re-Interpreting the Woodfuel Problem

#### Deforestation:

- not a structural and fundamentally insoluble problem,
- but temporary mutations and adaptations between societies and the environment.

#### Woodfuel harvesting:

- woody resources are a country's assets, which sould be valued appropriately (short-term & long-term),
- woodfuel business constitutes a sector of major economic importance
- an opportunity for rural communities to earn a sustainable cash income.

## **Towards a Sustainable Woodfuel Supply**

#### Three principles for intervention:

- (i) to geographically redirect and rationalize the woodfuel harvesting
- (ii) management by rural people
- I (iii) woodfuel harvesting is legitimate business



## **TDLF Management Tools**

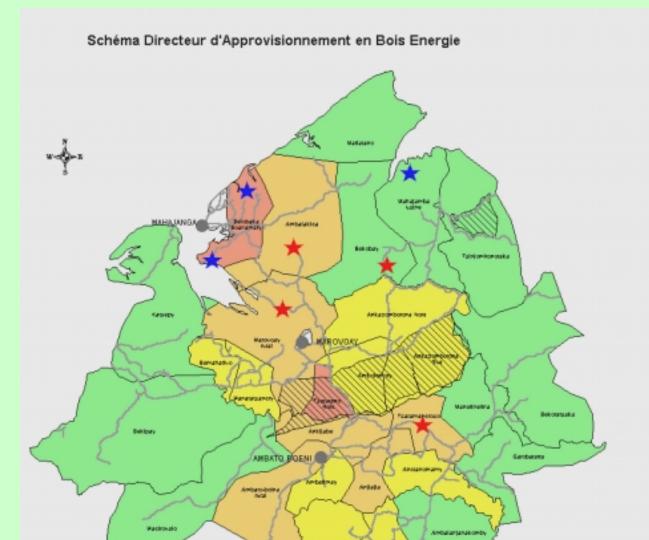
#### Four tools:

- (i) woodfuel supply master plan
- (ii) rural woodfuel markets (with simple forestry management plans)
- (iii) environmental monitoring
- (iv) regulatory and tax reform.



## **Woodfuel Supply Master Plan**

- covers economically-viable woodfuel catchment areas
- is an irreplaceable monitoring and land-planning tool
- defines notably the geographic priorities, forms of action to implement and harvesting guidelines to respect
- not a rigid planning tool, provides priorities for intervention and develops guidelines; it also provides the means to monitor progress.
- is based on cross-analysis of:
  - (i) available woody resources;
  - (ii) woodfuel flows; and
  - (iii) human dynamics
- uses efficient and modern techniques, such as satellite imagery, GPS field survey, in-depth socio-economic surveys, and GIS data base and mapping



Carte nº7

# Réorientation des flux Exploitation à réduire Exploitation à stabiliser Exploitation à ne pas encourager Développement possible de l'exploitation Interventions prioritaires Contrats GELOSE-bois-énergie Recherche développement



## **Rural Woodfuel Market (RWM)**

- Developed by World Bank Household Energy Project in Niger (1989-96)
- a self-sustaining natural woodland management system
- a place where woodfuel dealers can buy firewood and charcoal
- operated by a village level association
- set the selling prices of woodfuel independently
- collect woodfuel tax and deliver permits
- a simple plan agreed between the village association and the local forestry service:
  - (i) an annual woodfuel quota; and (ii) a set of very simple woodfuel cutting and forestry rules.
- creation of a RWM is subject to prior official agreement



## **RWM Experience**

#### In Niger:

- RWM managed woodland area ranges between 2,000 and 5,000 ha
- creation of a RWM, including management plan design, costs no more than US\$ 20,000 (< US\$ 10/ha)
- 60 RWM still operationals, 5 yrs after project termination
- each RWM generates average annual incomes of F CFA 2 million per year (about US\$ 300,000 per year) and F CFA 200,000 per year of tax revenues
- tax revenues have been used for building or rehabilitation of heath unit, school and mosque, repairing water pumping system, vaccination campaign, etc.
- Situation is likely similar in Mali, but this is the subject of the next presentation
- TDLF management and RWM development provide great Decentralization tool

## **Other TDLF Management Tools**

#### Environmental monitoring:

- provide feedback & fine tuning
- enlithening of local authorities and rural populations

#### Regulatory and tax reform:

- enable RWMs development
- provide incentives for woodfuel dealers to go to RWM
- require efficient control system
- over time the system will become less important, and eventually obsolete when all areas are under community management.



## **Acting on the Demand Side**

#### Four principles:

- (i) understand market and consumer behaviors
- (ii) individual decision to shift to a new fuel or a new stove
- (iii) promote private sector investment in the household fuel business
- (iv) open new markets for woodfuel

## **Demand Management Tools**

#### Price follow-up

provide crucial feedback on sector evolution

# Permanent consumer panels

- I indispensable for properly preparing marketing actions and assessing their impacts
- some hundreds families per city

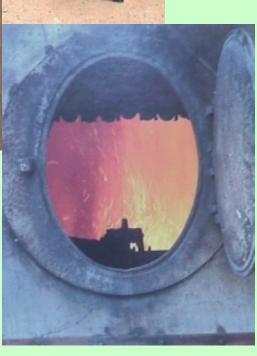


## **Others Demand Management Tools**

#### Improved stoves

- taking into account the large experience gained
- Diversification of fuels and stoves
- Support to new market development
  - the foretold death of woodfuel as cooking fuel
  - make use of existing well-structured woodfuel supply chains







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rue Fortunière, 46240 Labatide-Murat, France E-mail: marge@marge.fr